tain was struck by lightning and shivered to atoms. A house near by was entirely demolished by the flying fragments of rock. Several houses were also struck by lightning, killing one person and fatally injuring four others.

Ravanna, Mercer county, Missouri.—Three men were killed by lightning near this place on the 14th.

Norwich, Connecticut.—At 5.30 p. m., of the 22d, a barn was struck by lightning and consumed by fire in a few minutes.

TEMPERATURE OF WATER.

The temperature of water as observed in rivers and harbors at the Signal-Service stations, during June, 1883, with the average depth at which the observations were made, are given in the table below. Owing to the breakage of the instruments, observations were not made at Milwaukee, Wisconsin, from 3d to 21st, inclusive, and at Wilmington, North Carolina, from 9th to 21st:

Temperature of Water for June, 1883.

STATION.	Temperature at bottom.		Range.	Average depth, feet and inches.		Mean temperature of the air at station.
	Max.	Min.		ft.	in.	
	°	°	°			°
Atlantic City, New Jersey	71.6	58.6	13.0	5	0	67.2
Alpena, Michigan	67	53.8	13.2	11	9	58.7
Augusta, Georgia	87.5	78.3	9.2	7	6	79.0
Baltimore, Maryland	78	66	12.0	9	6	74.6
Block Island, Rhode Island	63.5	53.1	10.4	8	10	64.4
Boston, Massachusetts	64.7	57.0	7.7	20	5	69.0
Buffalo, New York	70.2	55	15.2	10	8	63.8
Burlington, Vermont*	60.6	55	5.6	20	9	.....
Cedar Keys, Florida	88.8	82.6	6.2	12	4	82.1
Charleston, South Carolina	85.1	74.8	10.3	41	4	80.3
Chicago, Illinois	66.2	52.3	13.9	7	6	64.1
Chincoteague, Virginia	80	70	10.0	5	6	70.6
Cleveland, Ohio	72.0	57.3	14.7	14	0	67.3
Detroit, Michigan	68	56	12.0	23	11	67.9
Delaware Breakwater, Delaware	70.8	61.0	9.8	9	7	69.0
Duluth, Minnesota	62.1	43.5	18.6	14	7	59.4
Eastport, Maine	46.1	40.7	5.4	15	5	57.5
Escanaba, Michigan	64.3	47.0	17.3	15	0	59.4
Galveston, Texas	88	79	9.0	12	8	82.9
Grand Haven, Michigan	75.3	63.2	12.1	19	0	62.1
Indianola, Texas	87.5	80.4	7.1	8	3	82.1
Jacksonville, Florida	87.5	78.0	9.5	18	0	80.9
Key West, Florida	89.0	82.3	6.7	16	11	83.8
Mackinaw City, Michigan	61.7	42.4	19.3	13	0	58.9
Marquette, Michigan	51	44	7.0	9	10	57.3
Milwaukee, Wisconsin†	64.4	45.6	18.8	8	0	62.1
Mobile, Alabama	86	76	10.0	16	11	81.3
New Haven, Connecticut	74.7	62.5	12.2	15	2	68.3
New York City	71.5	61.5	10.0	17	1	69.5
Norfolk, Virginia	80.6	70.0	10.6	16	9	76.9
Pensacola, Florida	83.5	75.4	8.1	17	9	80.1
Portland, Maine	58.5	46.0	12.5	18	2	66.4
Provincetown, Massachusetts	71.5	59	12.5	14	0	66.7
Punta Rassa, Florida*	91.0	81.6	9.4	11	0	.....
Sandy Hook, New Jersey	69.6	56.2	13.4	1	7	70.3
San Francisco, California	64.5	56.5	8.0	29	9	59.9
Savannah, Georgia	84.8	75.6	9.2	12	0	81.2
Smithville, North Carolina	84	74	10.0	10	0	77.2
Toledo, Ohio	76.7	60.6	16.1	11	6	69.7
Wilmington, North Carolina†	81.8	72.4	9.4	18	6	73.6

*A station discontinued on the 15th. †Observations incomplete. See text.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos have been observed in the various districts on the following dates:

New England.—8th, 9th, 15th, 16th, 18th, 27th, 29th.
Middle Atlantic states.—2d, 4th, 6th, 21st, 24th, 28th.
South Atlantic states.—3d, 4th, 7th, 10th, 21st, 22d, 24th.
Tennessee.—4th, 7th, 9th, 12th, 15th, 22d, 28th.
Ohio valley.—5th, 15th.
Lower lakes.—3d, 5th, 7th, 8th, 12th, 15th, 21st, 24th.
Upper lakes.—2d, 5th, 8th, 12th, 14th, 15th, 20th, 21st.
Extreme northwest.—2d, 3d, 4th, 7th.
Upper Mississippi valley.—1st, 2d, 4th, 6th, 8th, 12th to 16th, 20th, 23d, 24th, 25th, 28th.
Missouri valley.—3d, 4th, 6th, 7th, 11th, 14th, 16th, 23d, 27th, 28th.

Solar halos were also observed at the following stations not included in the districts named above: Lead Hill, Arkansas, 2d, 4th, 6th to 9th, 17th, 19th, 23d, 27th; Princeton, California, 5th; Sacramento, California, 8th, 17th; San Francisco, California, 8th, 17th; Visalia, California, 1st, 5th, 9th; Prescott, Arizona, 7th, 9th; Pike's Peak, Colorado, 9th; Punta Rassa, Florida, 7th; Pensacola, Florida, 4th, 6th, 9th, 13th, 26th; Lewiston, Idaho, 1st, 5th, 8th; Albany, Oregon, 2d, 22d; Roseburg, Oregon, 2d, 8th, 18th, 22d; Carson City, Nevada, 17th; Indianola, Texas, 3d; Palestine, Texas, 1st, 2d; Bainbridge Island, Washington Territory, 1st, 2d.

LUNAR HALOS.

Lunar halos have been observed in the various districts on the following dates:

New England.—10th, 14th, 15th, 17th, 18th.
Middle Atlantic states.—9th, 10th, 12th, 14th to 18th, 24th.
South Atlantic states.—9th, 10th, 17th, 21st.
Eastern Gulf.—13th, 16th, 19th, 20th, 21st, 24th.
Western Gulf.—11th to 22d.
Tennessee.—12th, 16th, 20th, 22d, 22d, 24th.
Ohio valley.—11th, 15th, 16th, 17th, 20th, 22d, 23d.
Upper lakes.—11th, 14th, 15th, 16th, 18th, 19th, 20th.
Upper Mississippi valley.—14th to 17th.

Lunar halos were also reported from the following stations not included in the districts named above: Visalia, California, 17th; Fort Buford, Dakota, 13th; Sanford, Florida, 11th, 17th; Saint Vincent, Minnesota, 21st; Kiantone, New York, 16th; Albany, Oregon, 14th; Fort Concho, Texas, 12th, 13th.

MIRAGE.

San Francisco, California, 5th.—A beautiful mirage was observed on the bay at 6 p. m., the vessels and the land on the opposite shore assuming peculiar shapes. Small schooners in the northern part of the bay appeared very large, and the shipping and ferry-boats in the harbor appeared with inverted images, one above the other.

New York City, 13th.—On this date a very unusual phenomenon was observed in this city and vicinity. The hulls of vessels assumed prodigious proportions, at times appearing to rise above the hills beyond them. There were many startling changes in the appearance of the familiar Coney Island landscape. At one time the entire village appeared doubled, the buildings being reflected upside down.

Mirage was also observed at the following stations:
Traverse City, Michigan, 29th, 30th.
Indianola, Texas, 3d, 24th, 26th.

MISCELLANEOUS PHENOMENA.

SUN SPOTS.

The following record of sun spots for the month of June, 1883, has been forwarded by Mr. D. P. Todd, Director of the Lawrence Observatory, Amherst, Massachusetts:

Date—June, 1883.	No. of new		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		Remarks.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
1, 9 a. m.	0	16‡	0	0	1	0	2	20‡	
2, 9 a. m.	1	5	0	0	1	2	3	25‡	
4, 11 a. m.	1	25‡	0	0	0	0	4	50‡	
4, 4 p. m.	0	0	0	0	0	0	4	50‡	
5, 12 m	0	0	0	0	0	0	4	50‡	
5, 6 p. m.	1	5	0	0	1	5	5	55‡	
6, 12 m	0	0	0	10‡	0	0	5	45‡	
8, 12 m	1	10‡	1	20‡	1	10‡	5	30‡	
9, 10 a. m.	0	0	0	0	0	0	5	30‡	
10, 12 m	0	0	1	5	0	0	4	15‡	
11, 6 p. m.	1	2	2	3	1	2	3	14‡	
12, 12 m	0	0	1	2	0	0	2	12‡	
15, 2 p. m.	1	2	0	0	0	0	3	14‡	
16, 9 a. m.	0	0	0	4	0	0	3	10‡	
17, 12 m	2	4	0	0	1	2	5	14‡	
19, 5 p. m.	0	15‡	1	5	0	0	4	25‡	
20, 12 m	0	15‡	0	0	0	0	4	40‡	
21, 12 m	0	10‡	0	0	0	0	4	50‡	
22, 11 a. m.	1	3	0	10	1	3	5	40‡	
23, 12 m	0	5	0	5	0	5	4	40‡	
24, 12 m	1	7	1	5	0	5	4	40‡	
25, 4 p. m.	2	10‡	0	0	2	10‡	6	50‡	
26, 12 m	0	0	0	5	0	0	5	40‡	
28, 12 m	0	10‡	1	5	0	0	4	45‡	Two of spots quite large.
29, 11 a. m.	0	5	0	0	0	0	4	50‡	Do.
30, 9 a. m.	0	0	0	5	0	0	4	45‡	Do.

Faculæ were seen at the time of every observation. ‡Approximated.

Mr. H. D. Gowey, at North Lewisburg, Ohio, reports that sun spots were observed on all clear days during the month.